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ABSTRACT

In physical education classes at the secondary school level, objective, sex-fair evaluation is necessary to help each student develop to his or her fullest capacity. Student performance assessment must take into account the physiological differences between males and females after the onset of puberty. Within each sex there is a broad range of ability but, in general, factors such as muscular and cardiovascular endurance favor male performance. To accommodate the diversity in coeducational physical education classes, a performance evaluation plan focusing on the individual student should be developed, based on department or school objectives. Student performance goals should be written so that each goal can be ranked and weighted according to the importance of the course objective which is assessed. To allow for skill development, final assessment should include improvement as a factor in grading. An evaluation plan based on course objectives and pre-established criteria may include: (1) a written test; (2) an objective skill test; (3) a subjective skill evaluation; and (4) improvement. Grading and evaluation should be kept in perspective as an extension of sound practices already in use. (FG)

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Sex-Fair Performance Evaluation

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ABSTRACT

Sex-Fair Performance Evaluation

Up to age 10 or 12, few differences exist between the sexes. After puberty, due to differing hormonal changes, males generally are stronger and have a greater capacity for muscular and cardiovascular endurance. In addition, some sociologists feel that males are product or achievement oriented and females are more process oriented. Though these differences exist between the sexes, the degree to which they are present may be a reflection of cultural factors. We still do not know the full impact of what will result when cultural expectations minimize rather than magnify differences.

Physical education classes have usually included students with varying abilities and potentials. A sound evaluation plan must be based on the course objectives which reflect the school's, department's and teacher's philosophy. Assessment may include objective and subjective measures. One evaluation plan includes the following four components: (1) written test(s) - to assess knowledge, strategies, process. etc.; (2) objective skill tests - to assess fundamental skill aspects, achievement; (3) subjective evaluation - to assess positioning, adaptability to new situations; and (4) improvement. These components are weighted according to the importance of the course objective which they are assessing.

Assessment and evaluation must be used judiciously and objectively to assist in the educational process. It should help each student develop to his/her fullest capacity. Therefore, sex-fair evaluation practices are but an extension of the sound practices already in use.

In reflecting upon the question of sex fair performance evaluation and reviewing selected pertinent literature, I continually found I had to rephrase this topic into two questions:

1) What are the differences between the sexes?
2) How should the teacher take these points into consideration in an evaluation plan?

What Are the Differences Between the Sexes?

Up to age 10 or 12, few differences exist between the sexes. At puberty, due to differing hormonal changes, males become stronger and have greater capacity for muscular and cardiovascular endurance than females. Specifically, after puberty, in terms of body structure and composition, males are generally taller and heavier. Females have less bone mass, less lean body mass (muscle), and more fat than males. Females have longer trunks and shorter legs in relation to their total body length. Since the female's pelvis is slightly larger and rounder than the male's and since fat tends to accumulate in the pelvic and thigh region of females and trunk area of males, females have a lower center of gravity than males. Adipose tissue also serves an insulating function which inhibits heat dissipation. This is further compounded by the fact that females have fewer sweat glands and tend to have a slightly higher body temperature. Therefore, it can be concluded that, after puberty, males generally are stronger than females and are less taxed in a hot environment.

Differences between the sexes after puberty in relation to the cardiovascular system and blood characteristics favor males. The heart and lungs

of females are smaller. Stroke volume and vital capacity for females is less than for males. Though the maximum oxygen uptake capacity per unit of hemoglobin is the same for both sexes, males have a greater number of red blood cells and a higher percentage of total body hemoglobin. Therefore, the male's aerobic capacity is greater than that of the female's.[1]

Females appear to adapt to training and exercise in the same way that males do. There is an increase in strength, aerobic capacity, stroke volume, lean body mass and a decrease in adipose tissue. But, we must remember that, since males begin at a higher level, after puberty, they will still exceed females in these factors.

Some highly trained females have achieved similar percentages of body fat as males. In addition, when expressing physiological measures in proportion to one's lean body mass, sex differences tend to be reduced or disappear. For example, when strength is expressed in terms of lean body mass, males and females are nearly equal. Similarly, though trained males have higher aerobic capacity than trained females, the differences become small when one considers lean body mass.[2,3] However, to paraphrase Drinkwater, movement requires the entire body. Therefore, considering only lean body mass may be misleading.

The difference in performance levels between the trained and non-trained female athlete (intramural champion) is more dramatic than that between the trained and nontrained male athlete (intramural champion). In addition, trained female athletes often achieve higher physical performance levels than average male performers.[4]

Wyrick[5], Harris[6] and others have cautioned that, though some differences exist between the sexes, the degree to which they are present may be a reflection of cultural factors. Comparisons and generalizations regarding differences between average individuals are difficult to determine since most of the data have been obtained from highly trained individuals of whom there are few women, small samples, and studies which vary in design.

Physical education classes have usually included students with varying abilities and potential. Today, the majority of these classes are coeducational. Since the magnitude of the biological differences between the sexes is not great before puberty, the problem of coeducational physical education classes and sex-fair evaluation procedures at the elementary school level have been minimal.

Following puberty, at the secondary school level, potential differences exist which favor males. When one focuses on the differences between the sexes, the question of sex-fair evaluation appears critical and confusing. However, recognizing that the physical education teacher has traditionally had to work with and, therefore, assess and evaluate individuals whose abilities vary widely, gives us the realization that the challenge of developing a sex-fair evaluation plan is not insurmountable.

One question raised earlier is the impact which the socialization process has on performance. What will happen when the coeducational class structure becomes the norm and cultural expectations minimize rather than magnify differences? Men are potentially superior physiologically.

However, within each sex there is a broad range of abilities. To accomodate this diversity, the question is how to develop an evaluation plan which will be fair to everyone. First, we will focus upon the pertinent questions for consideration in developing an evaluation plan.

Developing an Evaluation Plan

The question which first needs to be addressed is why assess and evaluate student performance? Basically, what are the purposes of grading? The purposes often include:

1) educational systems require them - traditional
2) motivation
3) a means of assessing student progress
4) a means for identifying student strengths and weaknesses

If tradition were the sole reason for giving grades, I feel the procedure would be eliminated. Giving grades because educational systems require them is questionable with the number of satisfactory alternatives available. Two alternatives are: evaluation based on mastery learning and maintaining student portfolios containing representative examples of the student's work. However, even these procedures require consideration of the variables identified below.

Do grades really motivate students or are they not often tools by which the teacher may influence student views? Bostrom, et al[7] found students who achieved high grades often shifted their views to coincide with those of their teachers. Shaw and McCuen[8] showed that achievement

breeds achievement, whereas failure often results in further failure. This and other studies would lead to the conclusion that grades often motivate those who need this type of positive reinforcement least and are detrimental to those at the other end of the continuum, only reinforcing their self-concept of failing.

Do grades really reflect student achievement or has school become only a series of prescribed hurdles which must be mastered before being allowed to do one's own thing? A dean of education, as reported in the September, 1965 Journal of Health, Physical Education and Recreation[9] justified grades in physical education by stating:

> Neither innate physical ability nor the degree of physical development achieved determines the grade earned in a physical education class. Grading is based on a number of criteria. It is possible for a student who has relatively low natural ability to achieve creditable marks in physical education by excelling in knowledge about games and application of rules, by the use of effective strategy, and by habits of punctuality and preparedness.

What is the purpose of physical education? Is each course a cram course of knowledges, skills, fitness, competitive attitude development (winning) and discipline including the development of proper habits such as showers, clean clothes, punctuality, etc.?

Grades may be powerful tools which often have resulted in undue pressure and influence on students. This is reflected in the often verbalized: "The grading . . . game kept me from the real goal of education - the development of myself as a person."[10]

Do teachers want to be known as being in the grading game or are we not really interested in how pupil assessment can make a positive contribution

to a student's education? The starting point in evaluation lies in a clarification of one's goal of education. The Illinois State Board of Education in the Seventies published recommended goals for education in Illinois. The following goals were particularly meaningful to me. The educational system must:

1. provide opportunities which help students master the basic skills of communication, computation, and problem-solving
2. foster a feeling of adequacy and self-worth on the part of all students
3. provide opportunities for students to express the full extent of their creativity
4. provide experiences which help students adapt to a world of change
5. provide experiences which result in habits and attitudes associated with citizenship responsibilities[11]

Each of these goals demonstrates a student centered approach. This approach is further emphasized by the overall goal of education in Illinois: "the educational development of all persons to the limits of their capacities."[12]

With this overall goal in mind, each school and department must develop its own objectives. For example, in physical education, my general objective is the development of a student's self-understanding of one's environment through physical activity. Each of us, either departmentally or individually, must determine our own goals prior to developing specific course objectives. Evaluation, then, is based upon how well the student accomplishes the course objectives with the weighting of various components which comprise the grades being determined by the relative importance of each objective.

Logically, it would appear that students need to be involved in the process of developing course objectives. The degree to which they are involved will be determined by the school's and teacher's philosophy. Minimum involvement would be to carefully review course objectives with the class, encouraging student comments and questions which may result in slight modification in the course objectives.

Course objectives should be written so that each objective is measurable. An objective written in this manner clearly delineates the responsibilities and expectations for the students. The danger in a behavioral objective is that it has led to a "preoccupation with performance based criteria as educational outcomes".[13] Does assessment based solely on performance, interpreted to mean achievement, really provide the total picture if one's educational goal is to optimize the development of each individual's potential?

A second component for consideration is that of evaluating process. This component is mentioned in the "State goals" as problem solving. If one accepts this aspect as part of the course objectives, some means would need to be developed which would permit the assessment and evaluation of student process. Examples of the way in which this might be accomplished would be to have tests which require students to solve unique situations during game play or prescribed situations. The student would present the solution as well as the rationale upon which it was based. Assessment of the rationale would need to be made in terms of student consistency and justification.

In doing this type of evaluation, the teacher must be careful not to interject a value judgement but to base the assessment on pre-determined criteria involving the degree of consistency and logical approach demonstrated by the student. As soon as we interject our values, we would run the risk of molding students rather than helping each develop their own interests and capacities.

After the objectives have been accepted by the students and the criteria by which each objective will be assessed are clearly understood, the actual process of assessment may be initiated. The last step is the development of a grade based on clearly established criteria related to each course objective. The objectives are weighed according to their importance and the grade is ascertained accordingly. The grade then must be interpreted in relation to the course objectives, criteria and pre-established standards. It no longer is the hard and fast, reliable or significant number or letter which has but one interpretation by which one must live. Grades then may reflect different things for different people; but, in all cases, must be clearly understood and explainable to all interested parties - students, parents, administrators, etc. Grades may then become "a . . . useful process of student evaluation which helps them understand their present level of . . . performance in terms of specific course objectives."[14]

Example of a Sex (People) Fair Evaluation Plan in Physical Education

From the foregoing discussion, it is clear that the initial steps in developing an evaluation plan are the clear delineation of course objectives

which are ranked in importance resulting in a weighting of each objective. A decision must be made as to the manner in which each objective will be assessed. The choices include assessment through written, verbal and performance measures which may include objective as well as subjective testing procedures. The teacher must be certain to assess the various components encompassed in the course rather than using a variety of methods to assess the same skill. For example, if an objective skill test is used to assess shooting ability, a subjective assessment of the same component may be superfluous given the limited class time available. Whereas, it may be appropriate to subjectively determine the manner in which the student established court position for a shot or pass.

As previously reported, biological differences exist which may impact on skill development. Therefore, there is a broad range of ability within and between the sexes. It would appear that in addition to assessing final performance (achievement), consideration should be given to including improvement as a factor in grading. Grading on improvement requires a pre- and post-test and must recognize that students who begin at the lower end have a greater potential for improvement than those who begin at a higher point. Alternative means for grading on improvement are:

1. Develop separate norms for various levels of initial test performance.

2. Determine the maximum score for the test being used. An individual's improvement score is the difference between the initial and final score divided by the individual's potential for improvement (the difference between the individual's initial score and maximum test score). For example, if a maximum score is 60 and an individual's test score is 20, the potential for improvement is 40.

If the final score was 40, the actual improvement would be 50 percent. Therefore, an individual whose initial score was 56 and final score was 58 may be considered to have improved as much (50%) as the individual in the first example.

One section of the discussion on developing an evaluation plan dealt with the concern of assessing achievement as well as process. Greendorfer, in an article entitled "Gender Differences in Physical Activity"[15], discusses the influence specific reference groups (family, teachers, coaches, peers) have on the sport socialization process. Implied in that article was that males are product or achievement oriented while females are more process oriented. Therefore, a sex-fair evaluation plan must reflect the possibility of this cultural difference between the sexes.

One example of a sex (people)-fair evaluation plan based on course objectives and pre-established criteria may include:

Written Test(s) To assess knowledges, strategies, process, etc.	25%
Objective Skill Tests To assess fundamental skill components such as shooting ability, eye-hand coordination (ball control), etc.	25%
Subjective Evaluation Positioning relative to the ball and teammates, ability to react to new situations, etc.	25%
Improvement	25%

In conclusion, then, let's change the perspective from "Wad-Ja-Get?" to "What have you learned?". Evaluation should not be the focus of education

but should evolve naturally. The purpose of education is the development of the individual, regardless of sex, and not to get a grade. Let's keep evaluation in its proper perspective, to be used judiciously, objectively and to assist in the educational process by helping each student develop to their fullest capacity in self-understanding and understanding the environment through physical activity.

FOOTNOTES

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[2]Astrand, P. O. and K. Rodhal, Textbook of Work Physiology, New York: McGraw-Hill, 1970.

[3]vonDobeln, W., "Human Standard and Maximal Rate in Relation to Fat-Free Body Mass", Acta Physiologica Scandinavian Supplement, 126 (1956), 1.

[4]Gerber, E. W., J. Felshin, P. Berlin, and W. Wyrick, The American Woman in Sport, Reading, Massachusetts: Addison-Wesley Publishing Co., 1974.

[5]Ibid

[6]Harris, D. V., "Physical Sex Differences in Sport Involvement: A Matter of Degree", NAGWS Research Reports, Vol. III (Eds., Marlene Adrian and Judith Frame), Washington: American Alliance for Health, Physical Education, and Recreation, 1977, p. 117.

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[10]Kirschenbaum, H., S. B. Simon, and R. W. Napier, Wad-Ja-Get: The Grading Game in American Education, New York: Hart Publishing Company, Inc., 1971.

[11]Action Goals for the Seventies: An Agenda for Illinois Education, Office of the Superintendent of Public Instruction, Springfield, Illinois, 1972.

[12]Ibid

[13]Combs, A., "Educational Accountability from a Humanistic Perspective", Educational Researcher, 2: September, 1973.

[14]May, R. E., "Dean of Education Speaks", Journal of Health, Physical Education, and Recreation, September 1965.

[15]Greendorfer, S. L., "Gender Differences in Physical Activity", Motor Skills: Theory into Practice, Vol. 4, No. 2, p. 83-90, 1980.

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